

CLAIMS

1. A process for treating a fiber or a fiber-based material such as a yarn, a woven, knitted or nonwoven textile material, paper, leather or a material based on wood fibers, to improve its adsorption properties, wherein the following successive operations are carried out on said fiber or said material:
- a) applying a solid mixture of cyclodextrin(s) and/or cyclodextrin derivative(s) and/or inclusion complex(es) of cyclodextrin(s) and/or cyclodextrin derivative(s), at least one poly(carboxylic) acid and/or at least one poly(carboxylic) acid anhydride and optionally a catalyst;
 - b) heating to a temperature in the range 150°C to 220°C;
 - c) washing with water; and
 - d) drying.
2. A process according to claim 1, wherein the solid mixture is applied by impregnating the fiber or fiber-based material with an aqueous solution of cyclodextrin(s) and/or cyclodextrin derivative(s) and/or inclusion complex(es) of cyclodextrin(s) and/or cyclodextrin derivative(s), at least one poly(carboxylic) acid and/or at least one poly(carboxylic) acid anhydride and optionally, a catalyst, then drying the impregnated fiber or impregnated fiber-based material.
3. A process according to claim 1, wherein the fiber or fiber-based material is dried at a temperature in the range 40°C to 150°C, preferably 110°C or substantially 110°C before the heating operation proper, at a temperature in the range 150°C to 220°C.
4. A process according to claim 1, wherein the poly(carboxylic) acid and poly(carboxylic) acid anhydride

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are selected from the following poly(carboxylic) acids and poly(carboxylic) acid anhydrides: saturated and unsaturated acyclic poly(carboxylic) acids, saturated and unsaturated cyclic poly(carboxylic) acids, aromatic
5 poly(carboxylic) acids, hydroxy poly(carboxylic) acids, citric acid, poly(acrylic) acid, poly(methacrylic) acid, 1,2,3,4-butanetetracarboxylic acid, maleic acid, citraconic acid, itaconic acid, 1,2,3-propane-
10 tricarboxylic acid, aconitic acid, all-cis-1,2,3,4-cyclopentanetetracarboxylic acid, mellitic acid, oxydisuccinic acid and thiodisuccinic acid.

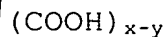
5. A process according to claim 1, wherein the catalyst is selected from dihydrogen phosphates, hydrogen
15 phosphates, phosphates, hypophosphites, alkali metal phosphites, alkali metal salts of polyphosphoric acids, carbonates, bicarbonates, acetates, borates, alkali metal hydroxides, aliphatic amines and ammonia, preferably
20 selected from sodium hydrogen phosphate, sodium dihydrogen phosphate and sodium hypophosphite.

6. A process according to claim 1, wherein the cyclodextrin is selected from α -cyclodextrin, β -cyclodextrin and γ -cyclodextrin and wherein the
25 cyclodextrin derivatives are selected from hydroxypropyl, methyl or acetyl derivatives of α -cyclodextrin, β -cyclodextrin and γ -cyclodextrin and inclusion complexes formed from said cyclodextrins or said cyclodextrin
30 derivatives.

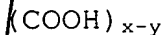
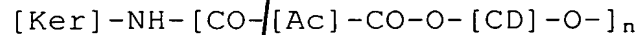
7. A fiber or fiber-based material, wherein the fiber or fibers of the fiber-based material is selected from
fibers comprising a hydroxyl function and/or an amine function, the fiber or the fibers of said fiber-based
35 material being bonded, via a covalent bond of an ester or amide type, to at least one molecule of cyclodextrin and/or cyclodextrin derivative and/or to an inclusion

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complex of cyclodextrin or cyclodextrin derivatives or to a linear and/or branched and/or cross-linked compound of cyclodextrin(s) and/or cyclodextrin derivative(s) and/or to inclusion complexes of cyclodextrin or cyclodextrin derivatives and wherein the structure comprises the repetition of a unit with general formula:



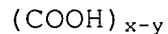
or



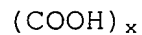
where $2 \leq y < x-2$; $x \geq 3$ and n is 1 or more, and in which:

[Cell] represents the macromolecular chain of a natural or artificial cellulose fiber;

[Ker] represents the macromolecular chain of a natural or artificial protein fiber;



represents the molecular chain of a poly(carboxylic) acid



where at least two carboxylic acid functions $(\text{COOH})_y$ have undergone esterification or esterification and amidation respectively and which carries at least one carboxylic acid function $(\text{COOH})_{x-y}$ that has not

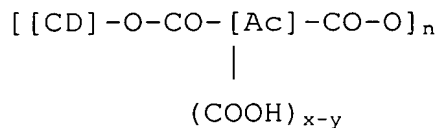
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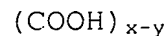
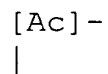
undergone an esterification or amidation reaction;
and

- [CD] represents the molecular structure of α -cyclodextrin, β -cyclodextrin or γ -cyclodextrin or a cyclodextrin derivative, preferably a hydroxypropyl, methyl or acetyl α -cyclodextrin, β -cyclodextrin or γ -cyclodextrin derivative, or an inclusion complex of said cyclodextrins or said cyclodextrin derivatives.

8. A fiber or fiber-based material, wherein said fiber or fiber-based material is coated with a cross-linked copolymer composed of cyclodextrin(s) and/or cyclodextrin derivative(s) and at least one poly(carboxylic) acid wherein the structure comprises the repetition of a unit with general formula:



where $2 \leq y < x-2$; $x \geq 3$ and
 n is 1 or more, and in which:



represents the molecular chain of a poly(carboxylic)
acid



where at least two carboxylic acid functions $(\text{COOH})_y$ have undergone esterification and which carries at least one carboxylic acid function $(\text{COOH})_{x-y}$ that has not undergone an esterification reaction; and

- [CD] represents the molecular structure of α -cyclodextrin, β -cyclodextrin, γ -cyclodextrin, a cyclodextrin derivative, preferably a hydroxypropyl, methyl or acetyl α -cyclodextrin, β -cyclodextrin or γ -cyclodextrin derivative, or an inclusion complex of said cyclodextrins or said cyclodextrin derivatives.

9. A fiber or fiber-based material according to claim 7, wherein the poly(carboxylic) acid is selected from saturated and unsaturated acyclic poly(carboxylic) acids, saturated and unsaturated cyclic poly(carboxylic) acids, aromatic poly(carboxylic) acids, hydroxy poly(carboxylic) acids, preferably selected from citric acid, poly(acrylic) acid, poly(methacrylic) acid, 1,2,3,4-butanetetracarboxylic acid, 1,2,3-propanetricarboxylic acid, aconitic acid, all-cis-1,2,3,4-cyclopentanetetracarboxylic acid, mellitic acid, oxydisuccinic acid, and thiodisuccinic acid.

10. A fiber or fiber-based material according to claim 7, containing an insecticide or repellent agent forming a complex with molecules of cyclodextrin(s) and/or cyclodextrin derivative(s).

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